

## REMARKS

Claim 97-129 are pending, with claims 1-96 having previously been canceled and claims 97-107 and 114-129 having been withdrawn. Claims 108-111 have been amended, as has the title of the application.

Specifically, in claim 108, the chemical structure representing the compounds of the invention has been adapted to clarify what Applicants wish to claim for the purpose of this application. Support for this structure is found in the specification, for example, at page 35, structure (VII). Substituents G and E are defined in the specification at, for example, page 25, lines 8-9, and page 30, lines 28-29; and page 19, lines 26-27, and page 29, lines 27-28, respectively. Substituents represented by the structure I(c) have been deleted from claim 108. Substituents B<sup>1</sup> and B<sup>2</sup> are now directed to substituents where amino groups, if present, may be protected by amino protecting groups. Markush language is now also used to claim subject matter in the alternative (in claim 108 as well as in other of the amended claims). Reference to R groups R<sup>3</sup> and R<sup>18-21</sup> has been deleted, as these R groups are not referenced in the structure of provided in claim 108. Claim 108 also now clearly reflects that its subject matter also includes salts of the claimed compounds. Support for this amendment is found throughout the specification. See, e.g., page 94, lines 10-12; page 96, lines 3-5; and page 98, lines 1-3. The term "nucleobase-binding group" has also been deleted from the claim.

Claim 109 has been amended to reflect that it concerns the compounds of claim 1 wherein *n* is 2 or more. Due to the prior cancellation of claim 1, claim 110 has been amended to include language of claim 1. Claim 111 has been redrafted to use preferred terminology.

The claims as amended herein are fully supported by the specification and add no new matter. The amendments have been made to present the claimed invention using preferred terminology and organization, and not for reasons related to patentability. Notwithstanding this, Applicants reserve the right to pursue subject matter no longer or not yet claimed in this or a related patent application.

With regard to Applicants' previously submitted Information Disclosure Statements, Applicants wish to note that they have recently changed attorneys (a new power of attorney

appointing the undersigned will follow shortly). Legible copies of the references cited in the IDSs are being compiled and will be provided as soon as they are all available.

With regard to trademark-related matters (see Paper 17, paragraph 7), Applicants respectfully request that this issue be held in abeyance until a notice of allowable subject matter issues, at which time Applicants will amend their specification, if and as necessary.

Applicants have amended the title of the application to make it more descriptive, as suggested in paragraph 8 of Paper 17, albeit using different terminology.

As for the abstract (see Paper 17, paragraph 9), Applicants respectfully request that this matter also be held in abeyance until a notice of allowable subject matter issues, at which time they will amend the abstract per the Examiner's suggestion.

Applicants respectfully request reconsideration of the invention as now claimed in view of the following additional remarks that concern the grounds of rejections set forth in Paper 17.

### **35 USC 112, Second Paragraph, Rejections**

Claims 108-113 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for several reasons. Each of these rejections is addressed in the order they appear in Paper 17.

As indicated in amended claim 108, the claimed compounds include salts of the compounds depicted by the structure in the claim.

Applicants respectfully submit that claim 108, as amended, clarifies and resolves the issues raised in paragraph 11 of Paper 17.

With regard to the issues raised in paragraph 12 of Paper 17, Applicants respectfully submit that the ordinarily skilled artisan will understand each of the allegedly indefinite terms, although they note that the term "nucleobase-binding group" has been deleted from claim 108 because it was redundant in view of the terms "naturally occurring nucleobase" and "non-naturally occurring nucleobase." As for a "non-naturally occurring nucleobase," this term refers to a nucleobase that does not occur in nature, as explained in the specification at page, lines 24-26, for example. Representative examples of such nucleobases include xanthine and derivatives of nucleobases such as 2-aminoadenine. *Id.* See also specification page 14, lines 5-18. There, in addition to listing a variety of nucleobase and nucleobase derivatives and analogues, several documents, including two U.S. patents, are cited (and incorporated by reference) that describe

nucleobases that do not occur naturally. Indeed, cited U.S. patent 5,432,272 describes non-naturally occurring bases, which are said to form “non-standard base pairs” when incorporated into double-stranded nucleic acids. Also, even absent such disclosure, the skilled artisan will understand that this term refers to any base that can be incorporated into a nucleic acid or nucleic acid analogue (hence, a “nucleobase”) analogously to a naturally occurring nucleobase.

The instant specification broadly defines the other allegedly indefinite terms listed in paragraph 12, and provides a number of specific, representative examples of each class. For instance, see specification page 27, lines 10-22, which lists a number of reporter groups and labels, aromatic ring-based structures, and intercalating agents. In light of these descriptions, and the common understanding and definitions of these terms in the art, Applicants respectfully submit that each of the classes of molecules listed in paragraph 12 of Paper 17 satisfies the requirements of 35 U.S.C. 112, second paragraph.

As for the comments in Paper 17 regarding incorporation by reference, Applicants note that any reference may be incorporated by reference. The distinction in this regard, although not relevant here, is in the context of “essential” material, with the rule being that essential material may be incorporated by reference from a U.S. patent, but not other reference classes. With regard to the issue discussed in paragraph 12 of Paper 17, Applicants respectfully submit that the issue is not one of “essential” material, but merely whether the terms used in the claims are definite for purposes of 35 U.S.C. §112, second paragraph. Applicants respectfully submit that they are, as demonstrated by the references cited in the specification at page 27, lines 10-22, for example.

Turning to the issue raised in paragraphs 13 and 14 of Paper 17, Applicants note that those in the art will understand what is meant by the terms “heterocyclic moiety” and “aromatic moiety,” and that these terms have been used in their broadest sense in the context of the claims. This being the case, an “aromatic moiety” is not limited to carbon-only ring structures, but also includes, without limitation, heteroaryl compounds, as well as those compounds listed in Paper 17, paragraph 13. Likewise, “heterocyclic” moieties include those that are aromatic and those that are not. Also, Applicants note that claim 108 itself references both “heterocyclic” and “aromatic” moieties, thereby obviating any confusion that might have arisen if only one of these terms had been used.

As for the comment in paragraph 15 of Paper 17 that the specification at page 16, lines 3-8, defines the term “intercalator” to mean “anything that can bind a nucleic acid molecule”, Applicants note that the cited definition, while correct in so far as it goes, is incomplete and thus lacks the proper context. Instead, the complete definition for the term states, “An ‘intercalator’ is a chemical moiety that can bind a nucleic acid molecule or a nucleic acid analogue molecule by inserting between adjacent nucleobases.” Specification page 16, lines 3-4. Thus, according to the invention, an “intercalator” binds a nucleic acid (or analogue thereof) by inserting between adjacent nucleobases. Specific, non-limiting examples of intercalators are then listed (see page 16, lines 5-8). In short, Applicants intend for the definition to include any intercalating substance. In order to claim a genus, one is not required to list every species, even if known. Instead, it is sufficient to provide representative examples in order to cover the genus.

Turning to paragraphs 18-20 of Paper 17, Applicants respectfully submit that claim 108 as amended moots these issues.

Next, with regard to paragraphs 21 and 22 of Paper 17, Applicants respectfully submit that claim 109 as amended obviates this issue.

As for the issue raised in paragraph 23 of Paper 17, Applicants respectfully submit that the amendment to claims 110 and 111 also obviates this issue.

Paragraph 24 of Paper 17 further rejects claims 110 and 111 as allegedly being indefinite due to use of the term “phosphono peptide nucleic acid monomer.” Applicants respectfully traverse because, as admitted in paragraph 24 of Paper 17, the specification describes several such monomers, including the provision of one or more structures. Further, those skilled in the art understand that PNAs, like nucleic acids, are assembled from smaller building blocks, frequently monomers such as phosphono peptide nucleic acid monomers in the case of PNAs, and nucleotides in the case of nucleic acids. Accordingly, Applicants respectfully contend that “phosphono peptide nucleic acid monomer” meets the requirements of 35 U.S.C. 112, second paragraph.

Applicants respectfully submit that the issue raised in paragraph 25 of Paper 17 has already been addressed above.

Applicants respectfully submit that the invention as now claimed obviates the various bases of rejection advanced in Paper 17 under 35 U.S.C. 112, second paragraph, and that in any

event those skilled in the art will readily understand the metes and bounds of the invention as claimed. Accordingly, the 35 U.S.C. 112, second paragraph, rejection should be withdrawn.

### **35 USC 112, First Paragraph, Rejections**

Claims 108-113 stand rejected under 35 U.S.C. 112, first paragraph, as allegedly lacking enablement because, “while being enabling for compounds with a hydrogen attached to the terminal atom N(T) and an amino (NH<sub>2</sub>) group attached to the terminal C(R<sup>12</sup>R<sup>13</sup>), does not reasonably provide enablement for any other groups attached at these positions.” Paper 17, paragraph 26. Applicants respectfully traverse this rejection. However, to advance prosecution, they have amended certain of the pending claims, including claim 108, by clarifying the structure of the claimed compounds. While the structures of the claims before and after amendment are synonymous, Applicants respectfully submit that the amendment to the structure of claim 108 simply clarifies the claimed subject matter, thereby obviating this basis of rejection. For this reason, the rejection should be withdrawn. Applicants also note that because this rejection has been obviated, it is unnecessary to address the various factors and related analysis laid out in paragraph 26 (and its following un-numbered paragraphs) of Paper 17. Accordingly, they do not acquiesce to the statements made in Paper 17 in this regard, and they reserve their right to contest some or all of such statements at a later date, should the need arise.

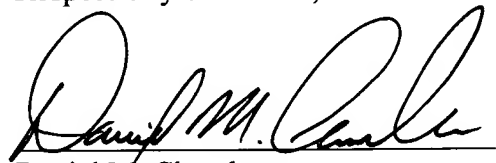
Some or all of claims 108-113 have also been rejected under 35 U.S.C. 112, first paragraph, as allegedly lacking enablement for: compounds represented by structures (as in claim 108) where  $n = 1$  (see Paper 17, paragraph 27); as allegedly violating the laws of chemistry (see Paper 17, paragraph 28); and allowing for insertion of monomers at locations other than certain between phosphorous and oxygen atoms (see Paper 17, paragraph 29). Applicants respectfully traverse these rejections as well, although they have been mooted by the revision made herein to the structure of claim 108. For this reason, Applicants have not addressed the merits of these rejections, nor do they acquiesce to them. In any event, each of these 35 U.S.C. 112, first paragraph, rejections may now be withdrawn.

**CONCLUSION**

Applicants respectfully submit that claims 108-113 are in condition for allowance, and they earnestly solicit an early notice to such effect. Should any issues or questions remain, the Examiner is encouraged to telephone the undersigned at 858.350.9690 so that they may be promptly resolved without the need for an additional formal action and response thereto.

Dated: 16 OCT 2003

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Daniel M. Chambers", written over a horizontal line.

Daniel M. Chambers  
Attorney for Applicants  
BioTechnology Law Group  
Reg. No. 34,561